

**Clouds and the Earth's Radiant Energy System
(CERES)**

Data Management System

**CERES Time Interpolation and Spatial Averaging (TISA)
(Subsystems 7.1, 8.0, and 10.0)**

**CERES Release 2 Test Plan
TRMM Launch**

Primary Authors

Lynn Jimenez and Rajalekshmy Raju

Science Applications International Corporation (SAIC)
One Enterprise Parkway, Suite 300
Hampton, VA 23666

Data Management Office
Atmospheric Sciences Division
NASA Langley Research Center
Hampton, VA 23681-0001

January 1998

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 Introduction	1
1.1 Document Overview	1
1.2 Subsystem Overview	1
1.2.1 Time Interpolation for Single and Multiple Satellites (Subsystem 7.1) ..	1
1.2.2 Compute Regional, Zonal, and Global Averages (Subsystem 8.0)	2
1.2.3 Compute Monthly and Regional TOA and SRB Averages (Subsystem 10.0)	3
2.0 Test Environment	4
2.1 External Interface Requirements	4
2.2 Directory Structure and File Descriptions	5
3.0 Software and Data File Installation Procedures	7
3.1 Installation	7
3.2 Compilation	8
4.0 Test and Evaluation Procedures	9
4.1 Stand Alone Test Procedures	9
4.1.1 Main Processor PCF Generator	9
4.1.1.1 Generation of Subsystem 7.1 PCF	9
4.1.1.2 Generation of Subsystem 8.0 PCF	10
4.1.1.3 Generation of Subsystem 10.0 PCF	10
4.1.2 Main Processor Execution	10
4.1.2.1 Procedure for Subsystem 7.1 Test Case	11
4.1.2.2 Procedure for Subsystem 8.0 Test Case	11
4.1.2.3 Procedure for Subsystem 10.0 Test Case	11
4.2 Normal Operating Procedures	12
4.3 Evaluation Procedures	12
4.3.1 Exit Codes	12
4.3.2 Log and Status File Results	12
4.3.3 Metadata Evaluation	12
4.3.4 Execution of Evaluation Software	12
4.3.4.1 Evaluation of Subsystem 7.1	12
4.3.4.2 Evaluation of Subsystem 8.0	13
4.3.4.3 Evaluation of Subsystem 10.0	13
4.4 Solutions to Possible Problems	13
Appendix A Acronyms and Abbreviations	A-1
Appendix B Directory Structure Diagrams.....	B-1
Appendix C File Description Tables.....	C-1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
Figure B-1. Directory Structure for the TISA Averaging (tisa_avg) Tar File	B-1

LIST OF TABLES

<u>Figure</u>		<u>Page</u>
Table 2-1.	CERESlib Routines used by TISA Averaging	4
Table C.1-1.	Production Scripts and Executables	C-1
Table C.2-1.	Process Control Files (PCF)	C-1
Table C.2-2.	Metadata Control Files (MCF)	C-2
Table C.3-1.	Production Make Files	C-2
Table C.4-1.	Ancillary Input Data	C-3
Table C.5-1.	Primary Input Data for Subsystem 7.1	C-3
Table C.5-2.	Primary Input Data For Subsystem 8	C-4
Table C.5-3.	Primary Input Data For Subsystem 10	C-4
Table C.6-1.	Subsystem 7.1 Output Data Files (Expected Results)	C-5
Table C.6-2.	Subsystem 8 Output Data Files (Expected Results)	C-7
Table C.6-3.	Subsystem 10 Output Data Files (Expected Results)	C-7
Table C.7-1.	Subsystem 7.1 Output Data Files (Production Results)	C-8
Table C.7-2.	Subsystem 8 Output Data Files (Production Results)	C-11
Table C.7-3.	Subsystem 10 Output Data Files (Production Results)	C-11
Table C.8-1.	Output Temporary Data Files (Production Results)	C-12
Table C.9-1.	Error and Status Message Files (Expected Results)	C-12
Table C.10-1.	Test Evaluation Software for TISA Averaging Subsystems	C-13

1.0 Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES will continue that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation, and to improve the consistency between the cloud parameters and the radiation fields, CERES will include cloud imager data and other atmospheric parameters. The first CERES instrument is scheduled to be launched on the TRMM spacecraft in 1997. Additional CERES instruments will fly on the EOS-AM platforms, the first of which is scheduled for launch in 1998, and on the EOS-PM platforms, the first of which is scheduled for launch in 2000.

1.1 Document Overview

This document, the CERES Release 2 Test Plan for the Time Interpolation and Spatial Averaging Subsystems (TISA) (7.1, 8.0, and 10.0) provides a description of the CERES Time Interpolation and Spatial Averaging Release 2 software and supporting data files and explains the procedures for installing, executing, and testing the software. A section is also included on validating the results of executing the software.

The document is organized as follows.

[Section 1.0 - Introduction](#)

[Section 2.0 - Test Environment](#)

[Section 3.0 - Software and Data File Installation Procedures](#)

[Section 4.0 - Test and Evaluation Procedures](#)

[Appendix A - Acronyms and Abbreviations](#)

[Appendix B - Directory Structure Diagrams](#)

[Appendix C - File Description Tables](#)

1.2 Subsystem Overview

1.2.1 Time Interpolation for Single and Multiple Satellites (Subsystem 7.1)

The time interpolation process (7.1), one of the two key parts of Subsystem 7.0, temporally interpolates CERES data and produces global synoptic maps of top-of-the-atmosphere (TOA)

fluxes and cloud properties on a 1.0-degree equal-area grid. Another key part of Subsystem 7.0, the Synoptic Surface and Atmospheric Radiation Budget (SARB), Subsystem 7.2, calculates synoptic maps, Synoptic Radiative Fluxes and Clouds (SYN), of the vertical structure of atmospheric and surface flux using the interpolated data as input and boundary conditions.

The main input to the time interpolation process is the Hourly Gridded Single Satellite Fluxes and Clouds (FSW) product, produced by Atmospheric Gridding and Spatial Averaging, Subsystem 6.0. The gridded shortwave (SW) and longwave (LW) TOA fluxes and cloud information are the key items to be interpolated. The radiative profile will be recalculated in the SARB part of Subsystem 7.0 using the interpolated fluxes as constraints. This process produces the internal product, Time Space Interpolate (TSI). These files contain nested grid-region data which are the input to Subsystem 7.2.

The time interpolation process produces global maps of TOA total-sky LW and SW flux, TOA clear-sky LW and SW flux, TOA window radiances, and cloud properties at 1, 4, 7..., 22 Greenwich mean time (GMT) for every day of the month. The process of producing synoptic maps involves several steps:

1. The FSW data are regionally and temporally sorted and merged.
2. The ancillary geostationary data which are used in the interpolation of TOA fluxes are regridded to the CERES grid system and regionally and temporally sorted and merged.
3. Cloud properties from the CERES times of observation are interpolated to the synoptic times.
4. The CERES TOA LW and SW fluxes are interpolated to synoptic times using geostationary data to assist in modeling meteorological variations between times of observations.

1.2.2 Compute Regional, Zonal, and Global Averages (Subsystem 8.0)

The Monthly Regional, Zonal, and Global Radiation Fluxes and Cloud Properties Subsystem produces regional, zonal and global monthly and monthly-hourly means. These means are calculated from one month of synoptic maps on a regional basis and then combined to produce zonal and global averages.

The main input to this Subsystem is the Synoptic Radiative Fluxes and Clouds (SYN) product produced by the Time Interpolation and Synoptic Flux Computation for Single and Multiple Satellites Subsystem (Subsystem 7.0). This product contains one month of 3-hourly synoptic maps of top-of-atmosphere (TOA) LW and SW fluxes, TOA window radiances, upwelling and downwelling SW and LW flux at each standard CERES pressure level, and numerous cloud parameters for each region of the CERES global 1.0-degree equal-area grid. The flux parameters include both total-sky and clear-sky.

The two archival products output from this Subsystem are the Monthly Regional Radiative Fluxes and Clouds (AVG) product (HDF-EOS format) which contains regional monthly and monthly-

hourly means of fluxes and cloud parameters and the Monthly Zonal and Global Radiative Fluxes and Clouds (ZAVG) product (HDF-EOS format) which contains the zonal and global monthly and monthly-hourly averages of the above parameters.

The main steps involved in the averaging process are

- Read the synoptically ordered data.
- Average the flux data to produce regional monthly and monthly-hourly means.
- Average the cloud properties using the specified weighting schemes to produce regional monthly and monthly-hourly means.
- Average the regional means to produce zonal means.
- Average the zonal means to produce global means.

1.2.3 Compute Monthly and Regional TOA and SRB Averages (Subsystem 10.0)

The Monthly Regional TOA and SRB Averages Subsystem (10.0) computes averages of TOA longwave (LW) and shortwave (SW) fluxes, surface fluxes, and cloud properties on regional, zonal, and global spatial scales. The main input to Subsystem 10.0 is the Hourly Gridded Single Satellite TOA and Surface Fluxes and Clouds (SFC) product produced by Surface Gridding and Spatial Averaging Subsystem (9.1). SFC contains hourly single satellite flux and cloud properties averaged over 1.0-degree regions. Subsystem 10.0 produces the Monthly Regional TOA and SRB Averages (SRBAVG) product (HDF-EOS format). Two methods are used to compute the regional TOA total-sky flux averages. TOA flux estimates from both of the two methods are used to produce estimates of surface flux at all temporal and spatial scales using the TOA-to-surface flux parameterization schemes for shortwave and longwave.

The process of producing the means stored in SRBAVG involves several steps:

1. The ancillary geostationary data which are used in the interpolation of TOA fluxes are gridded to the CERES grid system and regionally and temporally sorted and merged.
2. The TOA total-sky flux data are interpolated by two methods: the ERBE-like method and the geostationary data enhancement method.
3. The TOA clear-sky flux data, surface flux data, and the cloud property data are linearly interpolated.
4. Monthly and monthly-hourly means are calculated from the interpolated fluxes and cloud properties on regional, zonal, and global scales.

2.0 Test Environment

2.1 External Interface Requirements

The CERESlib Fortran 90 modules used by Subsystem 7.1, 8.0, and 10.0 software are listed in Table 2-1.

Table 2-1. CERESlib Routines used by TISA Averaging (Sheet 1 of 2)

Module Name	Version Number	Description
f90_kind	1.0	Provides F90 compiler specific KIND values
ceres_status	1.1	Provides a common set of file and return statuses
reference_grid	1.1	Provides an interface to the CERES reference grid
ceres_constants	1.1	Provides commonly used CERES constants
ceres_defaults	1.1	Provides system-defined CERES default values
ceres_indices	1.0	Provides commonly used array indices
ceres_time		Provides commonly time conversions
meta_util		
pcf	1.0	Provides run-time parameter from a PCF
io	1.0	Provides Toolkit IO wrappers
msg	1.1	Provides interface to the SMF Toolkit
cadm_mod	1.1	Provides subroutines to read and interpolate CERES SW and LW anisotropic models
surf_typdef	1.4	Provides f90 structures to interface for surface flux estimation algorithms
surf_sw_model_a	1.2	Provides Li-Leighton SW surface flux algorithm
surf_lw_model_a	1.2	Provides Inamdar-Ramanathan LW surface flux algorithm
surf_lw_model_b	1.2	Provides Gupta et al LW surface flux algorithm
sfc_type_def	1.5	Provides SSF f90 structure definition and subroutines to read, write, open, and close SSF files
range_check	1.1	Provides general range checking functions
moa_io	1.1	Provides MOA f90 structure definition and subroutines to read, write, open, and close MOA files

Table 2-1. CERESlib Routines used by TISA Averaging (Sheet 2 of 2)

Module Name	Version Number	Description
solar_declination	1.2	Calculates the solar declination and distance correction
tisa_grid_type_def		Provides type declarations for FSW & SFC products.
sfc_type_def		Provides type definitions for SFC data product
sfc	1.1	Provides a read/write interface to the SFC file
sfc_file	1.1	Acts as a wrapper to the sfc module
fsw_type_def		Provides type definitions for FSW data product
fsw	1.2	Provides a read/write interface to the FSW file
fsw_file	1.1	Acts as a wrapper to the fsw module
tsi_type_mod	1.0	Provides read/write interface to TSI data files and TSI secondary index file
sarb_params	1.0	Parameters in SYN that are not in TSI.
syn_io	1.0	Provides an interface to the SYN product
ggeo	1.1	Provides the interface to the ggeo file
ggeo_file	1.1	Provides an input wrapper to the ggeo module which provides information about the ggeo file
PCF.template	1.0	PCF template used by PCF generator.
polar_flag	1.0	Calculates the day-night indicator flags for the polar latitude zones
meta_util		Provides meta data routines
post_moa_file		Provides read/write routines to post moa files
qcheader		Provides header routines to qc product
weights	1.0	Calculates the area weighting factors for each zone

2.2 Directory Structure and File Descriptions

The CERES TISA Averaging Subsystems 7.1, 8.0 , 10.0 Release 2 delivery package contains thirteen tar files:

TISAavg_src_R2-039.tar.Z
 TISAavg_anc_R2-039.tar.Z
 TISAavg_data7_R2-039.tar.Z
 TISAavg_data8_1_R2-039.tar.Z
 TISAavg_data8_2_R2-039.tar.Z

TISAavg_data8_3_R2-039.tar.Z
TISAavg_data8_4_R2-039.tar.Z
TISAavg_data8_5_R2-039.tar.Z
TISAavg_data8_6_R2-039.tar.Z
TISAavg_data10_1_R2-039.tar.Z
TISAavg_data10_2_R2-039.tar.Z
TISAavg_data10_3_R2-039.tar.Z
TISAavg_test_plan_R2-039.tar.Z

The directory structures of the untarred files are shown in Appendix B. The contents of the tar files are categorized according to software files, ancillary data files, and test data files. A description of each file included in the delivery package can be found in Tables C.1-1 through C.10 in Appendix C.

3.0 Software and Data File Installation Procedures

This section describes how to install TISA Averaging Subsystems 7.1, 8.0, and 10.0 software in preparation for making the necessary test runs at the Langley DAAC. The installation procedures include instructions for uncompressed and untarring the delivered tar files, properly defining environmental variables, and compiling the TISA Averaging source code.

3.1 Installation

1. The scripts, Makefile, and Process Control Files in Subsystems 7.1, 8.0 and 10.0 expect the CERES environment variable, **\$CERESENV**, to point to a file which sets the following environment variables:

PGSDIR	Directory for Toolkit 5.2.1 libraries
CERESHOME	CERES system top directory
CERESLIB	Directory location of the CERESlib library files
F90	Pointer to the NAG 32-bit Fortran 90 compiler
F90COMP, FCOMP	NAG 32-bit Fortran 90 compile flags
F90LOAD	NAG 32-bit Fortran 90 load flags
PGSMMSG	Directory location of Toolkit 5.2.1 message files
PGSINC	Directory location of Toolkit 5.2.1 include files
HDFDIR	Directory location of HDF4.1r1 home directory
HDFEOSDIR	Directory location of hdfeos home directory

2. Change directory to the directory where you will install the TISA Averaging subsystems. The following instructions assume that the directory will be **\$CERESHOME**.
3. Uncompress and untar the TISA Averaging files for Subsystems 7.1, 8.0, and 10.0

```
> uncompress TISAavg_src_R2-SCCR.tar.Z
> tar xf TISAavg_src_R2-SCCR.tar
> uncompress TISAavg_anc_R2-SCCR.tar.Z
> tar xf TISAavg_anc_R2-SCCR.tar
> uncompress TISAavg_data7_R2-SCCR.tar.Z
> tar xf TISAavg_data7_R2-SCCR.tar
> uncompress TISAavg_data8_1_R2-SCCR.tar.Z
> tar xf TISAavg_data8_1_R2-SCCR.tar
> uncompress TISAavg_data8_2_R2-SCCR.tar.Z
> tar xf TISAavg_data8_2_R2-SCCR.tar
> uncompress TISAavg_data8_3_R2-SCCR.tar.Z
> tar xf TISAavg_data8_3_R2-SCCR.tar
> uncompress TISAavg_data8_4_R2-SCCR.tar.Z
> tar xf TISAavg_data8_4_R2-SCCR.tar
```

```

> uncompress TISAavg_data8_5_R2-SCCR.tar.Z
> tar xf TISAavg_data8_5_R2-SCCR.tar
> uncompress TISAavg_data8_6_R2-SCCR.tar.Z
> tar xf TISAavg_data8_6_R2-SCCR.tar
> uncompress TISAavg_data10_1_R2-SCCR.tar.Z
> tar xf TISAavg_data10_1_R2-SCCR.tar
> uncompress TISAavg_data10_2_R2-SCCR.tar.Z
> tar xf TISAavg_data10_2_R2-SCCR.tar
> uncompress TISAavg_data10_3_R2-SCCR.tar.Z
> tar xf TISAavg_data10_3_R2-SCCR.tar

```

3.2 Compilation

1. Create the message files and message include files:

```

> source $CERESENV
> cd $CERESHOME/tisa_avg/smf
> $CERESLIB/bin/smfcompile_all.csh

```

The smfcompile_all.csh will send a message to the screen at completion to indicate whether or not the compile was successful. DAAC personnel may have an alternate procedure for compiling these message files. Any alternate procedure should copy all message include files to the \$PGSINC directory and all message files to the \$PGMSG directory.

2. **tisa_710.exe**, the executable for the Subsystems 7.1 and 10 Main Processors, is not provided on the tar file. To create the executable on directory \$CERESHOME/tisa_avg/bin, type the following commands:

```

> source $CERESENV
> cd $CERESHOME/tisa_avg/src
> make -f make7_10 clean
> make -f make7_10

```

3. **tisa_8.exe**, the executable for the Subsystem 8 Main Processor, is not provided on the tar file. To create the executable on directory \$CERESHOME/tisa_avg/bin, type the following commands:

```

> source $CERESENV
> cd $CERESHOME/tisa_avg/src
> make -f make8 clean
> make -f make8

```

NOTE: It is very important to do the ‘make -f make7_10 clean’ and ‘make -f make8 clean’ before making the actual executables.

4.0 Test and Evaluation Procedures

This section provides general information on how to execute TISA Averaging Subsystems 7.1, 8, 10 and provides an overview of the test and evaluation procedures. It includes a description of what is being tested and the order in which the tests should be performed.

4.1 Stand Alone Test Procedures

4.1.1 Main Processor PCF Generator

The Main Processor production scripts run_7.1.1P1, run_8.1P1, and run_10.1P1, reference Process Control Files (PCF) which contain the correct file names and paths for the test procedures. These PCF files for the test cases are created by first executing an ASCII file generator, tisavg_ascii_gen_test.csh, and then executing the PCF generator, tisavg_pcfgen.csh. The script, tisavg_ascii_gen_test.csh, must be executed with the command line arguments SS YYYY MM, where:

SS = Subsystem (7.1, 8 or 10)
YYYY = Data Year (1986 for test case)
MM = Data Month (10 for test case)

For production runs, the ASCII file generator, tisavg_ascii_gen.csh, must be modified to include the file names for the production run, and then executed with the above command-line arguments to create the ASCII input file for a particular production run. The PCF generator, tisavg_pcfgen.csh, is then executed using the newly created ASCII input file name as a command-line argument.

NOTE: The PCF generator script, tisavg_pcfgen.csh, uses the file template.pcf. Therefore, template.pcf must exist in the same directory.

4.1.1.1 Generation of Subsystem 7.1 PCF

1. Generate the ASCII input file for the test case:

```
> cd $CERESHOME/tisa_avg/bin  
> tisavg_ascii_gen_test.csh 7.1 1986 10
```

The following file will be generated in \$CERESHOME/tisa_avg/bin/:

ascii_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

2. Generate the PCF for the test case:

```
> tisavg_pcfgen.csh ascii_7.1.1P1_TRMM-PFM-  
VIRS_AtLaunch_00000.198610
```

The following PCF will be generated in **\$CERESHOME/tisa_avg/rcf/**:

PCF_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

4.1.1.2 Generation of Subsystem 8.0 PCF

1. Generate the ASCII input file for the test case:

```
> cd $CERESHOME/tisa_avg/bin  
> tisavg_ascii_gen_test.csh 8 1986 10
```

The following file will be generated in **\$CERESHOME/tisa_avg/bin/**:

ascii_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

2. Generate the PCF for the test case for subsystem 8:

```
> tisavg_pcfgen.csh ascii_8.1P1_TRMM-PFM-  
VIRS_AtLaunch_00000.198610
```

The following PCF will be generated in **\$CERESHOME/tisa_avg/rcf/**:

PCF_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

4.1.1.3 Generation of Subsystem 10.0 PCF

1. Generate the ASCII input file for the test case:

```
> cd $CERESHOME/tisa_avg/bin  
> tisavg_ascii_gen_test.csh 10 1986 10
```

The following file will be generated in **\$CERESHOME/tisa_avg/bin/**:

ascii_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

2. Generate the PCF for the test case for subsystem 10:

```
> tisavg_pcfgen.csh ascii_10.1P1_TRMM-PFM-  
VIRS_AtLaunch_00000.198610
```

The following PCF will be generated in **\$CERESHOME/tisa_avg/rcf/**:

PCF_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610

4.1.2 Main Processor Execution

To execute each Subsystem, type in the script name followed by a string which designates the

instance of the product. The string should be formatted, ‘Sampling Strategy’_‘Production Strategy’_‘Configuration Code’.’Data Date’. The date date is formated YYYYMM, where YYYY is the 4-digit year, and MM is the 2-digit month.

NOTE: In order to run each test case, it is assumed that the following files exist in the directory \$CERESHOME/tisa_grid/data/out_exp/data/PMOA:

CER_PMOA_CERES_AtLaunch_00000.198610F1
CER_PMOA_CERES_AtLaunch_00000.198610F2
CER_PMOA_CERES_AtLaunch_00000.198610F3
CER_PMOA_CERES_AtLaunch_00000.198610F4

4.1.2.1 Procedure for Subsystem 7.1 Test Case

```
> cd $CERESHOME/tisa_avg/bin  
> run_7.1.1P1 TRMM-PFM-VIRS_AtLaunch_00000.198610
```

The Main processor will execute and produce the following output files in the directory \$CERESHOME/tisa_avg/data/data_7/out_comp:

CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.198610i*
CER_TSIN_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_JRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610

*i indicates multiple files, i = 1,.., 16

4.1.2.2 Procedure for Subsystem 8.0 Test Case

```
> cd $CERESHOME/tisa_avg/bin  
> run_8.1P1 TRMM-PFM-VIRS_AtLaunch_00000.198610
```

The Main processor will execute and produce the following output files in the directory \$CERESHOME/tisa_avg/data/data_8/out_comp:

CER_AVG_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_ZAVG_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_LQCRP_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_LRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610

4.1.2.3 Procedure for Subsystem 10.0 Test Case

```
> cd $CERESHOME/tisa_avg/bin  
> run_10.1P1 TRMM-PFM-VIRS_AtLaunch_00000.198610
```

The Main processor will execute and produce the following output files in the directory **\$CERESHOME/tisa_avg/data/data_10/out_comp**:

CER_SRBAVG1_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_SRBAVG2_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_NQCRP_TRMM-PFM-VIRS_AtLaunch_00000.198610
CER_NRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610

4.2 Normal Operating Procedures

Before executing the TISA Averaging Subsystems 7.1, 8.0 and 10.0, PCFs for each PGE must be generated and the appropriate input data must be available. The procedures for generating PCF files is similar to the procedure described in Section 4.1.1, except the ascii file generator is named **tisavg_ascii_gen.csh**.

4.3 Evaluation Procedures

This section provides information on how the test results are to be evaluated for TISA Averaging Subsystems.

4.3.1 Exit Codes

All TISA-averaging software terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS).

4.3.2 Log and Status File Results

The Error and Status Log Files will be located in the directories **\$CERESHOME/tisa_avg/data/data_7/errlogs**, **\$CERESHOME/tisa_avg/data/data_8/errlogs**, and **\$CERESHOME/tisa_avg/data/data_10/errlogs**, for Subsystems 7.1, 8 and 10, respectively.

4.3.3 Metadata Evaluation

Metadata files which end in extension ‘.met’ will be located in directories **\$CERESHOME/tisa_avg/data/data_7/out_comp**, **\$CERESHOME/tisa_avg/data/data_8/out_comp**, and **\$CERESHOME/tisa_avg/data/data_10/out_comp**, for Subsystems 7.1, 8 and 10, respectively.

4.3.4 Execution of Evaluation Software

4.3.4.1 Evaluation of Subsystem 7.1

```
> cd $CERESHOME/tisa_avg/test_suites/test_7
```

> **7.1.1P1_test.csh**

In \$CERESHOME/tisa_avg/test_suites/data_7 directory an ascii file comp_7.1.1P1.results will be generated. This file contains the results of the evaluation. Examine the output of the evaluation software for Subsystem 7.1 by typing:

> **more \$CERESHOME/tisa_avg/test_suites/test_7/7.1.1P1.results**

The final two lines of this file will report the status of the evaluation.

4.3.4.2 Evaluation of Subsystem 8.0

> **cd \$CERESHOME/tisa_avg/test_suites/test_8**
> **8.1P1_test.csh**

In \$CERESHOME/tisa_avg/test_suites/data_8 directory an ascii file comp_8.1P1.results will be generated. This file contains the results of the evaluation. Examine the output of the evaluation software for Subsystem 8 by typing:

> **more \$CERESHOME/tisa_avg/test_suites/test_8/8.1P1.results**

The final two lines of this file will report the status of the evaluation.

4.3.4.3 Evaluation of Subsystem 10.0

> **cd \$CERESHOME/tisa_avg/test_suites/test_10**
> **10.1P1_test.csh**

In \$CERESHOME/tisa_avg/test_suites/data_10 directory an ascii file 10.1P1.results will be generated. This file contains the results of the evaluation. Examine the output of the evaluation software for Subsystem 10 by typing:

> **more \$CERESHOME/tisa_avg/test_suites/test_10/10.1P1.results**

The final two lines of this file will report the status of the evaluation.

4.4 Solutions to Possible Problems

1. All output files are opened with status=NEW. These files must be removed before running test procedures.
2. Environment variable F90 must be set to the 32-bit NAG F90 compiler.
3. The latest version of CERESlib must be used (i.e. CERESlib with meta_util.f90 for TOOLKIT 5.2.1).

APPENDIX A
Acronyms and Abbreviations

Appendix A

Acronyms and Abbreviations

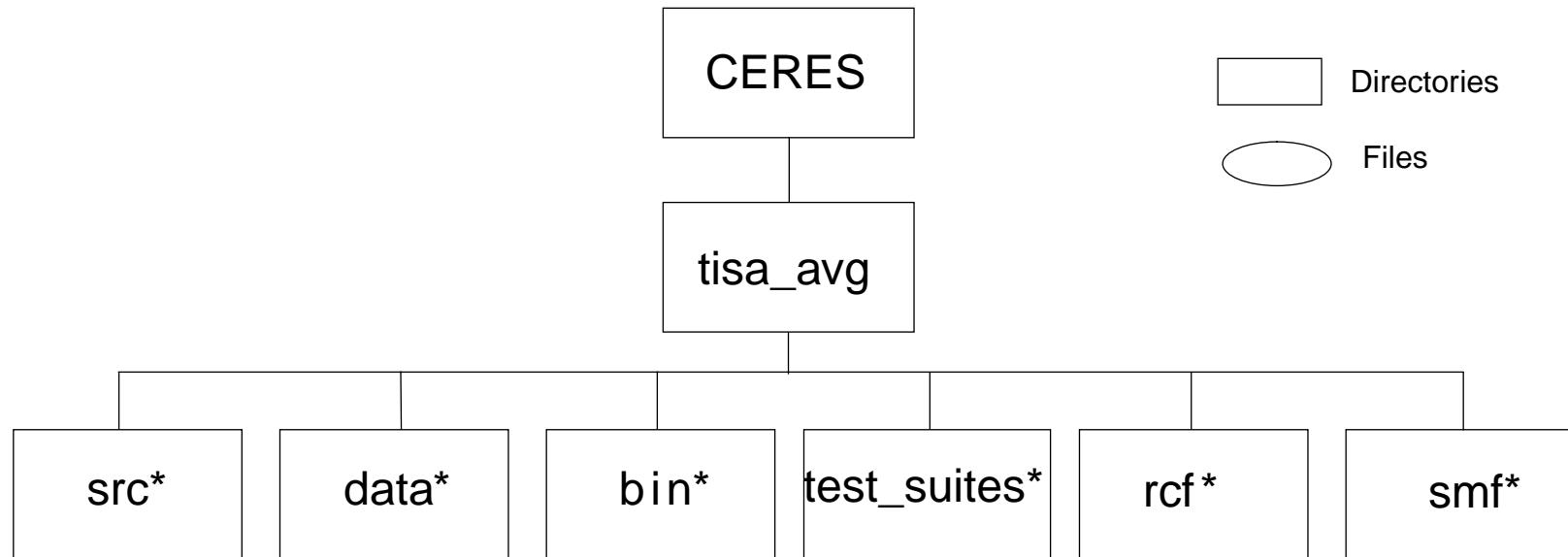
ADM	Angular Distribution Models
AVG	Monthly Regional Radiative Fluxes and Clouds
ASCII	American Standard Code Information Interchange
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
DAAC	Distributed Active Archive Center
ECS	EOSDIS Core System
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOSDIS	EOS Data Information System
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
F90	Fortran 90
FOV	Field-of-View
FSW	Hourly Gridded Single Satellite Fluxes and Clouds
GMT	Greenwich mean time
HDF	Hierarchical Data Format
LaTIS	Langley TRMM Information System
LW	Longwave
MOA	Meteorological, Ozone, and Aerosol
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PSF	Point Spread Function
QC	Quality Control
SDP	Science Data Production
SMF	Status Message File
SARB	Surface and Atmospheric Radiation Budget
SFC	Hourly Gridded Single Satellite TOA and Surface Fluxes
SRD	Software Requirements Document
SW	Shortwave
SYN	Synoptic Radiative Fluxes and Clouds
TISA	Time Interpolation and Spatial Averaging
TOA	Top-of-the-Atmosphere

TRMM Tropical Rainfall Measuring Mission
TSI Time Space Interpolate
ZAVG Monthly Zonal and Global Radiative Fluxes and Clouds

APPENDIX B
Directory Structure Diagram

Appendix B Directory Structure Diagrams

Directory Structure for the TISA Averaging Tar File



* Breakdown of subdirectories shown on following pages.

Figure B-1. Directory Structure for the TISA Averaging (tisa_avg) Tar File (Sheet 1 of 22)

Breakdown of the *tisa_avg*/smf Directory

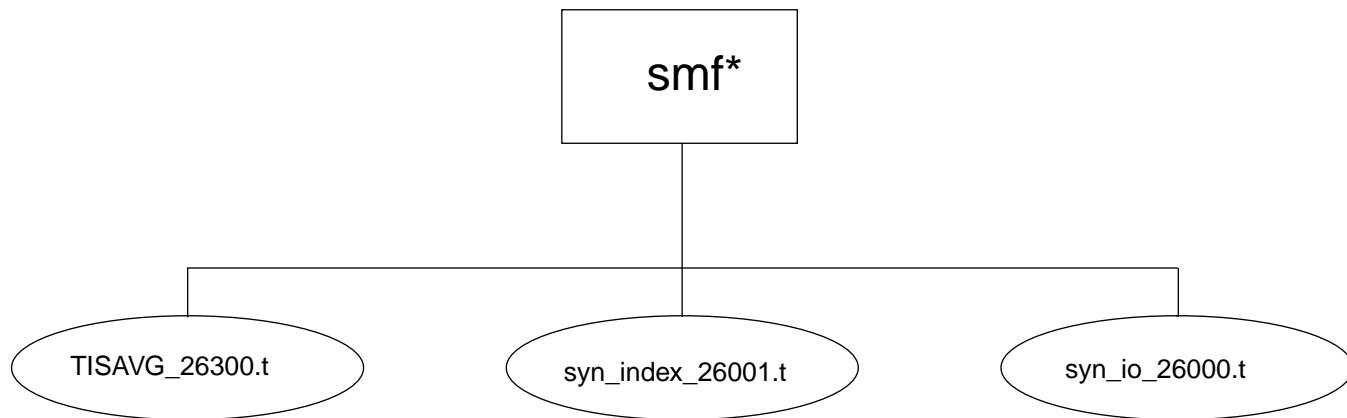
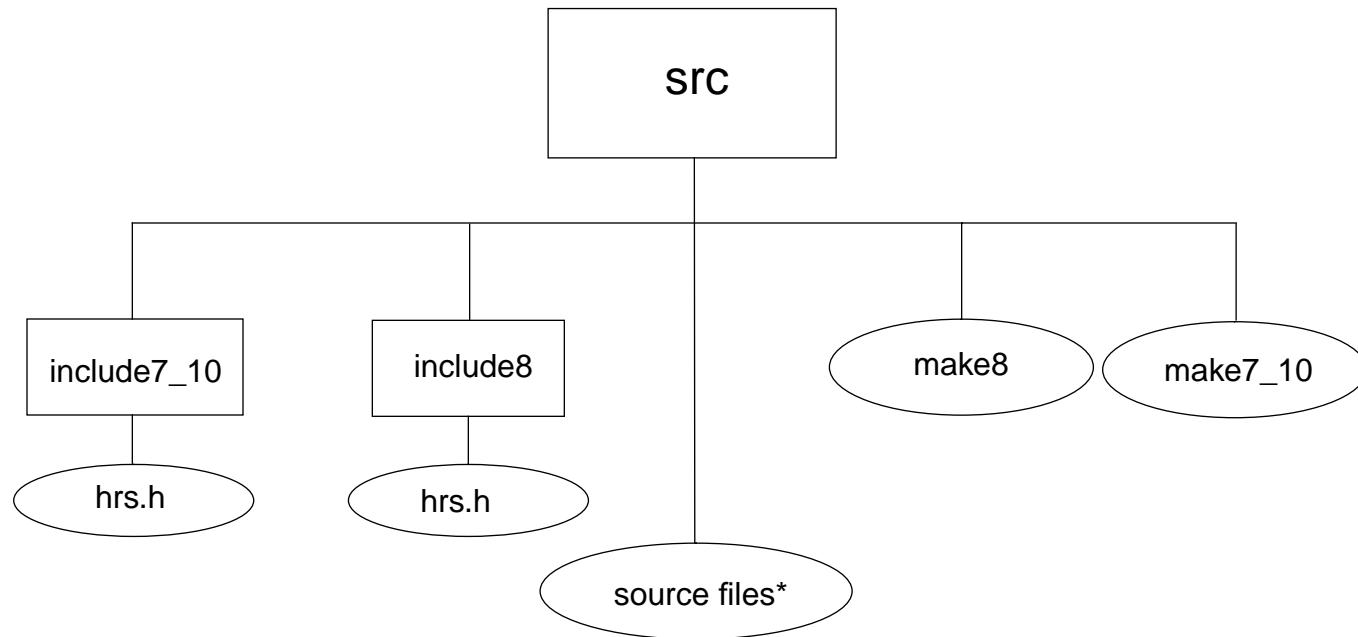


Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 2 of 22)

Breakdown of the *tisa_avg/src* Directory

B-3



* Source files are listed on the next two pages.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 3 of 22)

Source Files Contained in the *tisa_avg/src* Directory

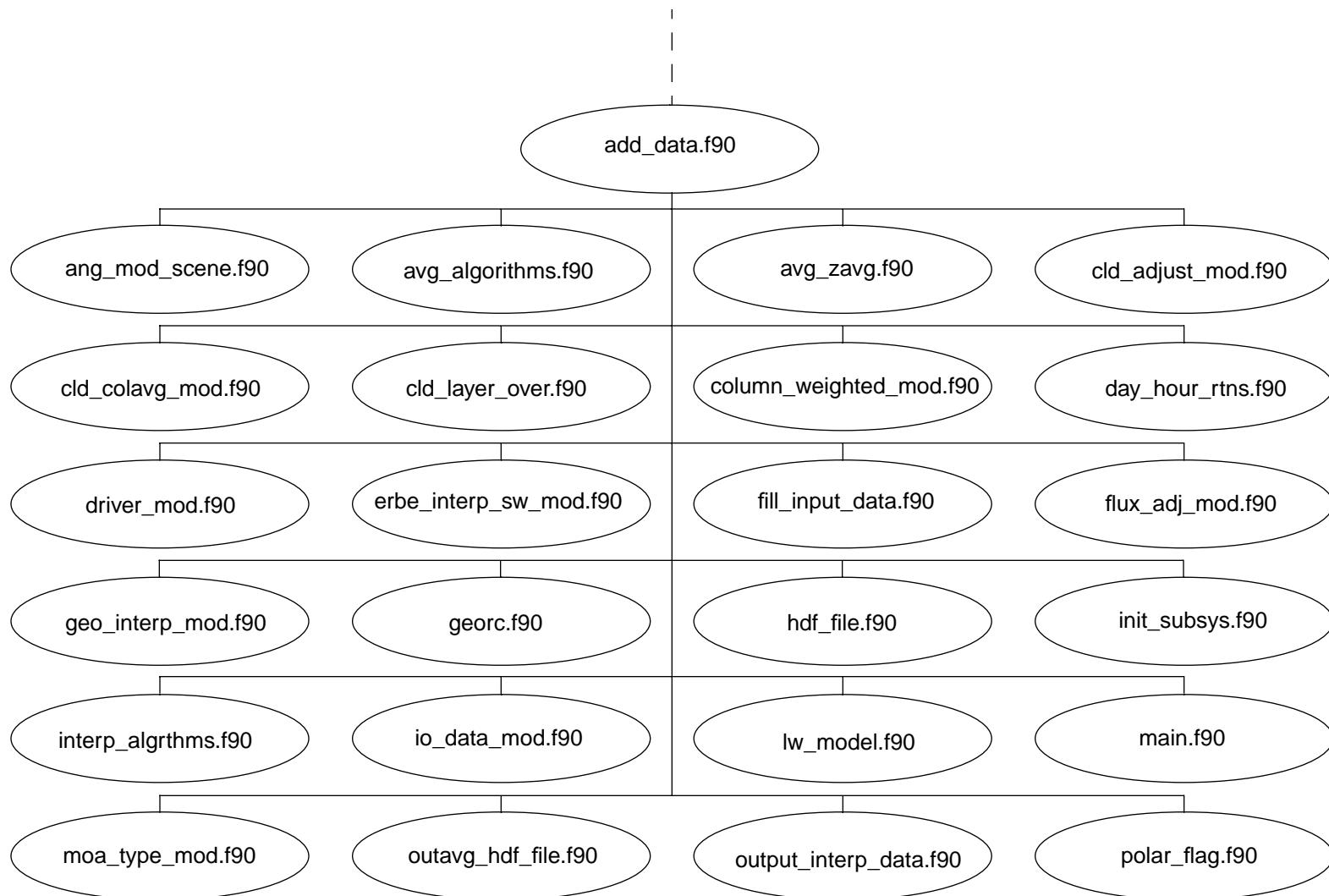
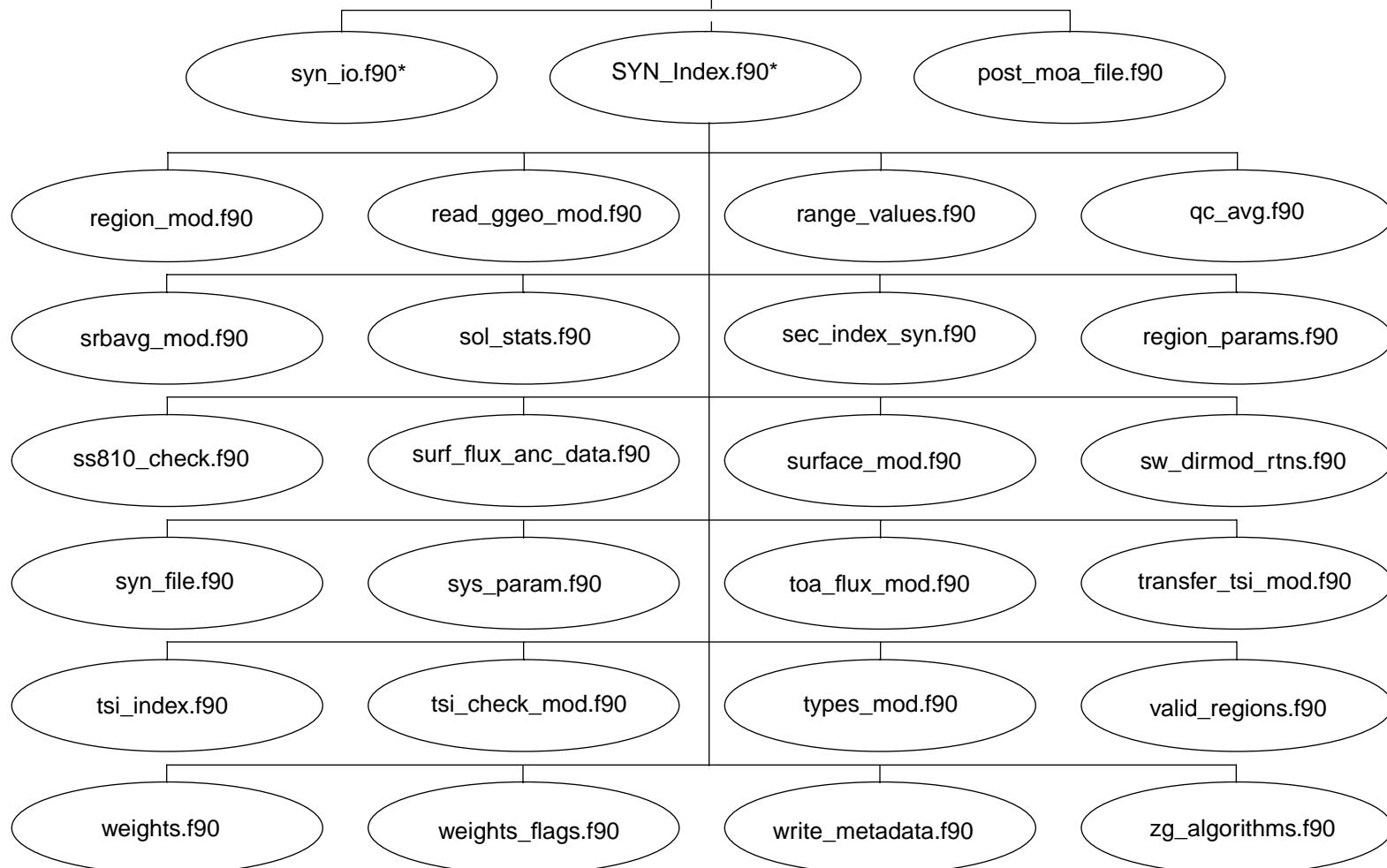


Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 4 of 22)

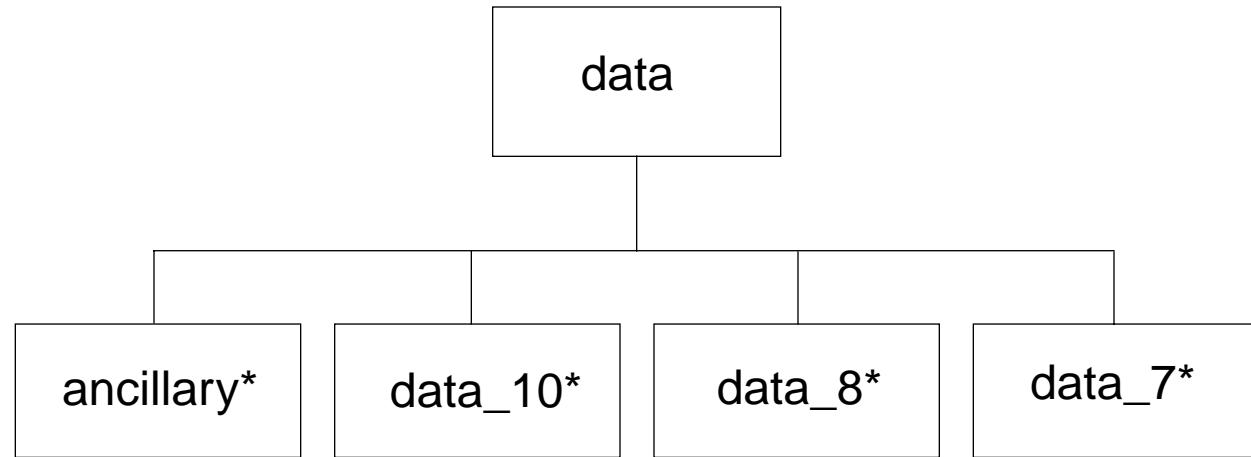
Source Files Contained in the *tisa_avg/src* Directory



*These files will eventually reside in CERESlib

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 5 of 22)

Breakdown of the *tisa_avg*/data Directory

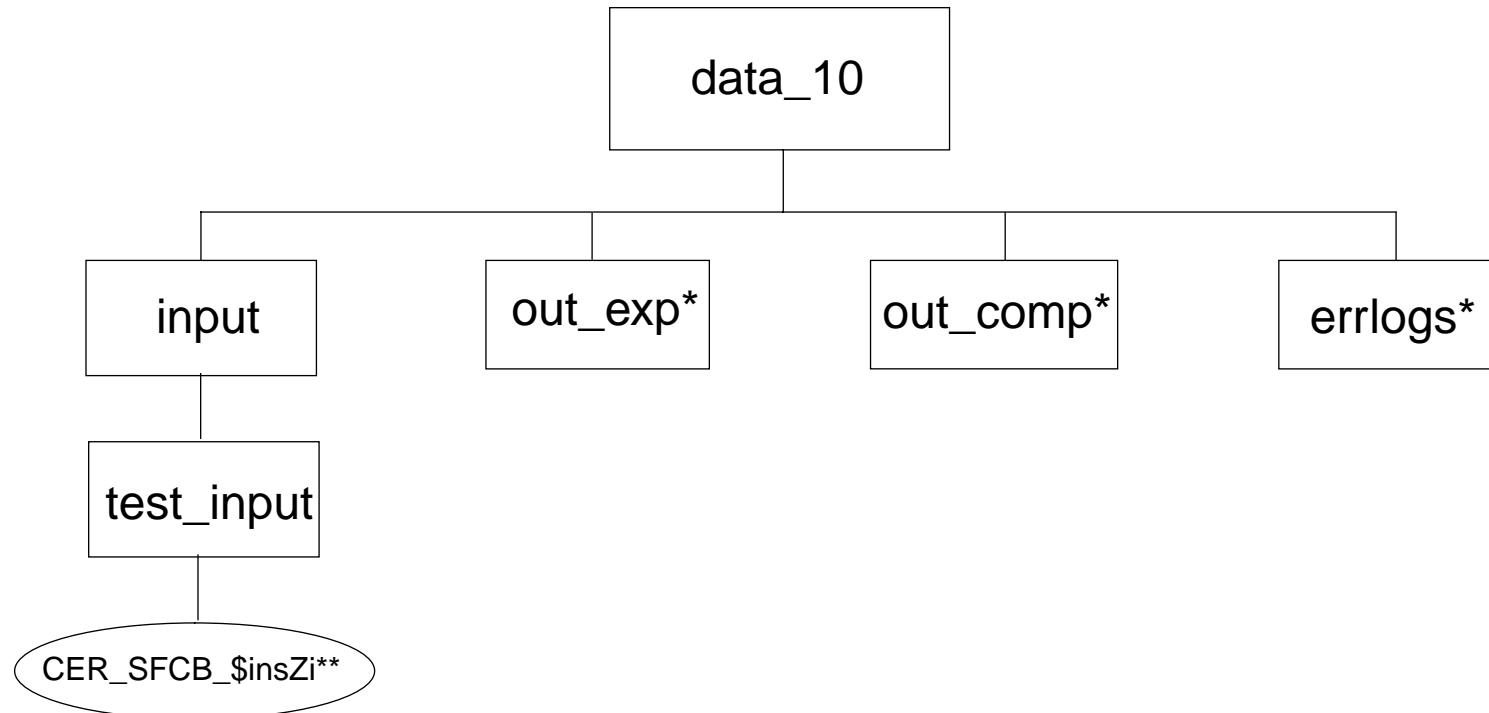


B-6

*Breakdown of subdirectories shown on following pages

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 6 of 22)

Breakdown of the *tisa_avg/data/data_10* Directory



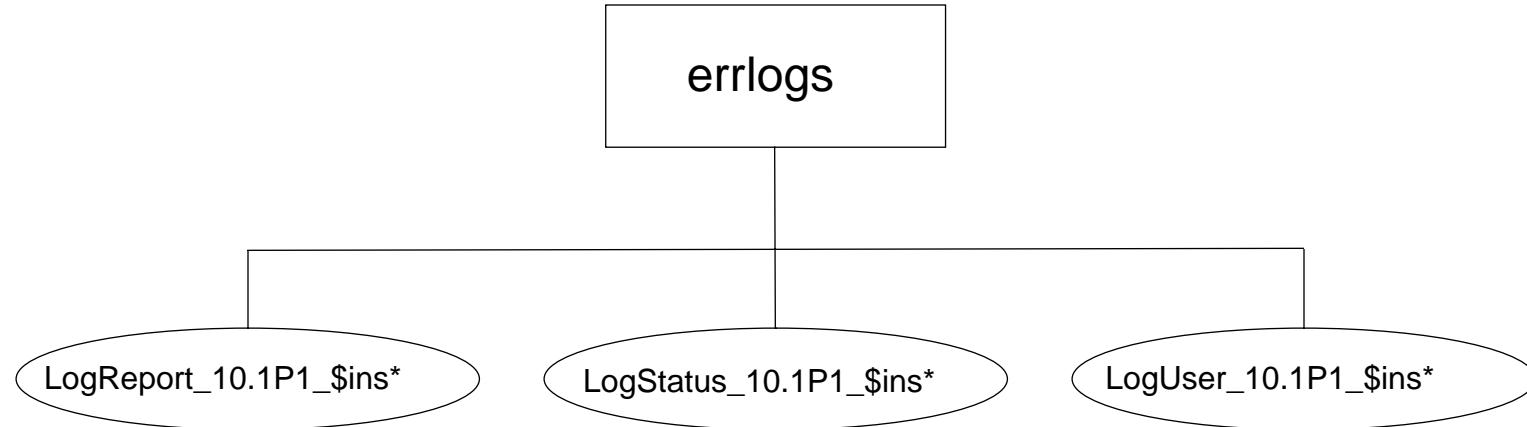
Zi** - Indicates multiple zonal files, i = 001,.., 180

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

*Breakdown of subdirectories shown on following pages

Figure B-1. Directory Structure for the TISA Averaging (tisa_avg) Tar File (Sheet 7 of 22)

Breakdown of the *tisa_avg/data/data_10/errlogs* Directory



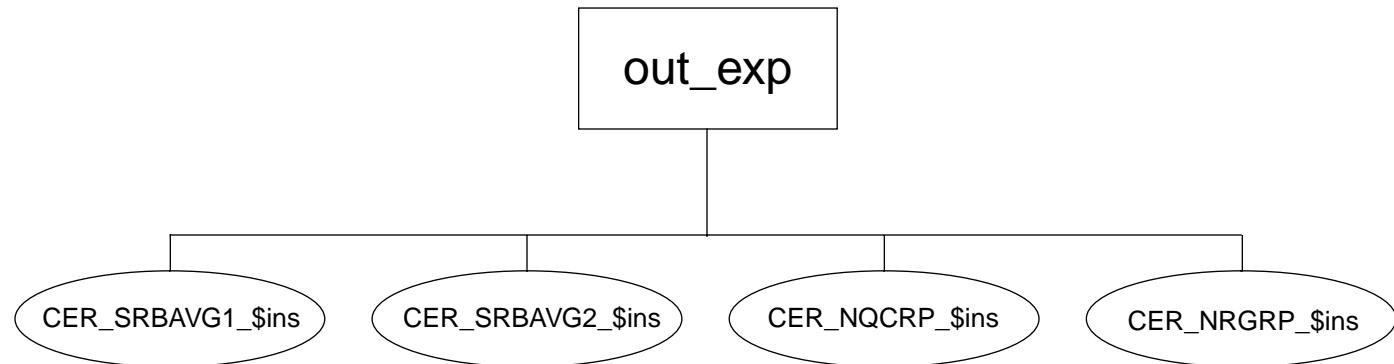
B-8

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyyymm

*These files are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 8 of 22)

Breakdown of the *tisa_avg*/data/data_10/out_exp Directory



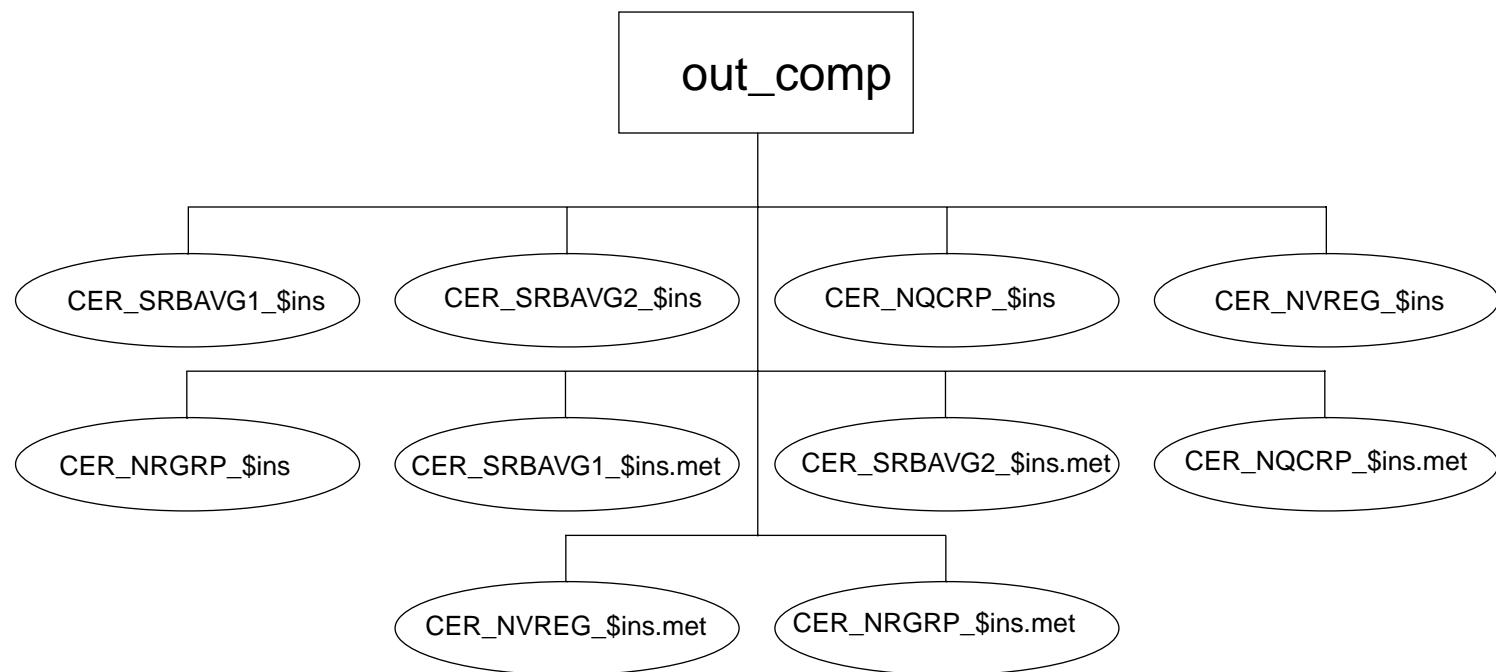
B-9

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 9 of 22)

Breakdown of the *tisa_avg/data/data_10/out_comp* Directory

B-10

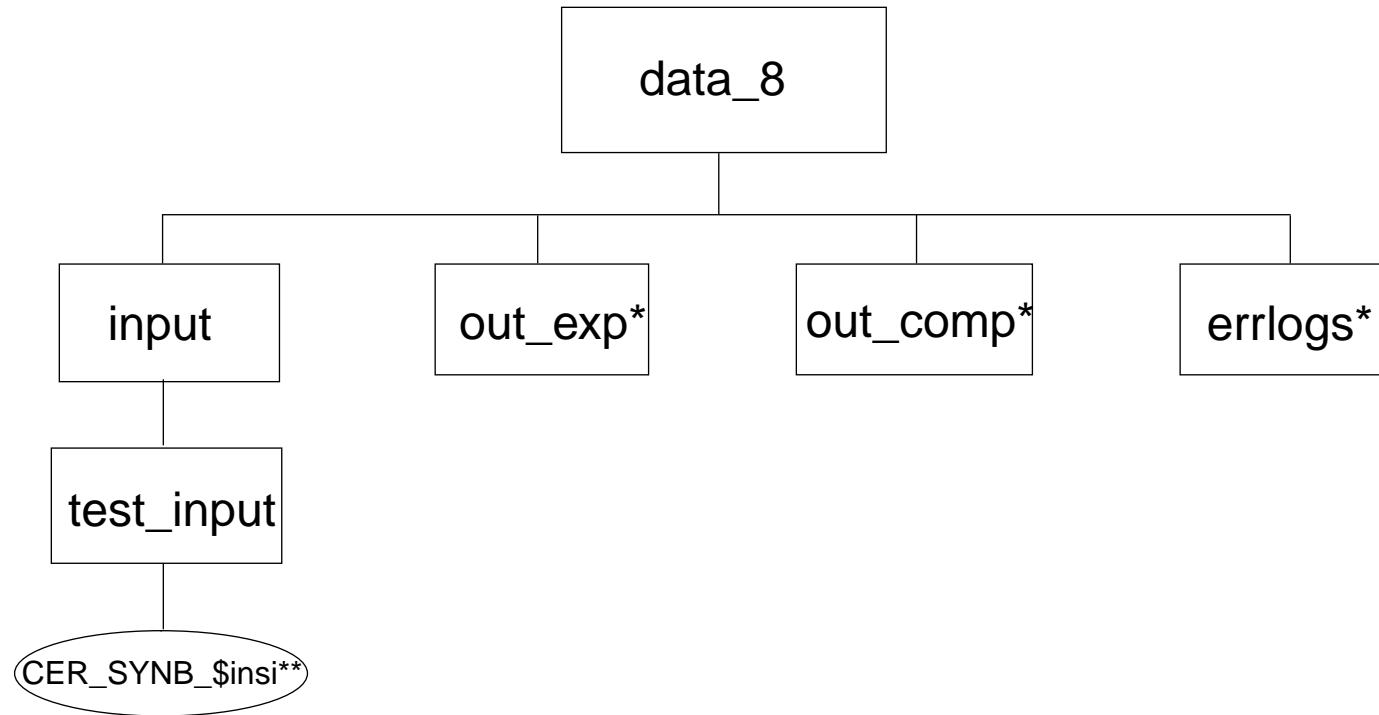


\$ins - Indicates TRMM_PFM_VIRS_AtLauncht_00000.yyyymmdd

*All of the files in this directory are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 10 of 22)

Breakdown of the *tisa_avg*/data/*data_8* Directory



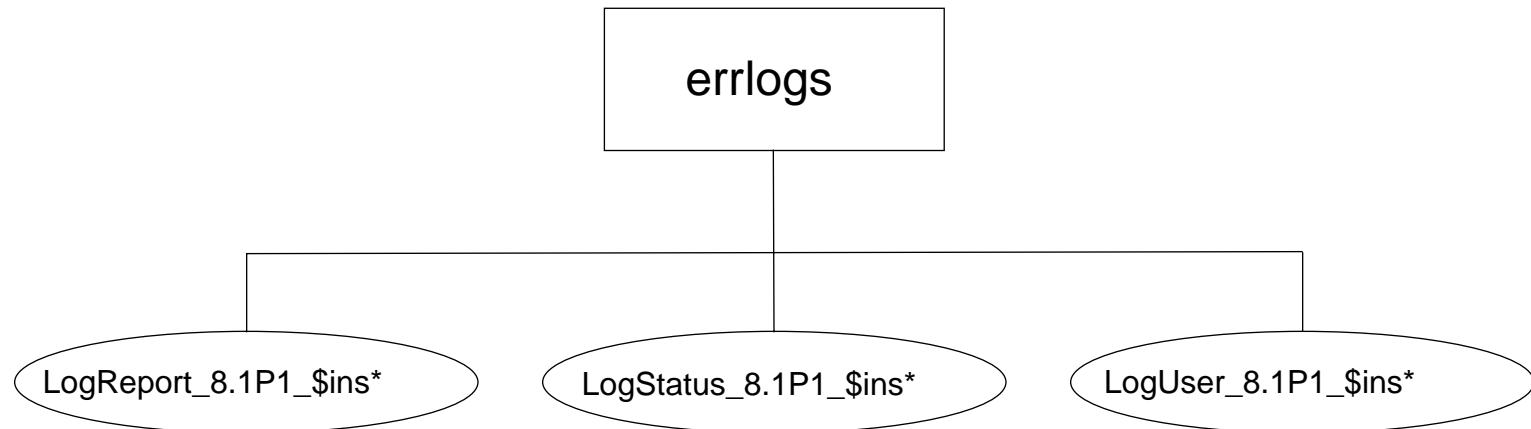
** Indicates multiple day files, i = 1,..,31

\$ins - Indicates TRMM_PFM_VIRS_AtLauncht_00000.yyyymmdd

*Breakdown of subdirectories shown on following pages

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 11 of 22)

Breakdown of the *tisa_avg*/data/data_8/errlogs Directory



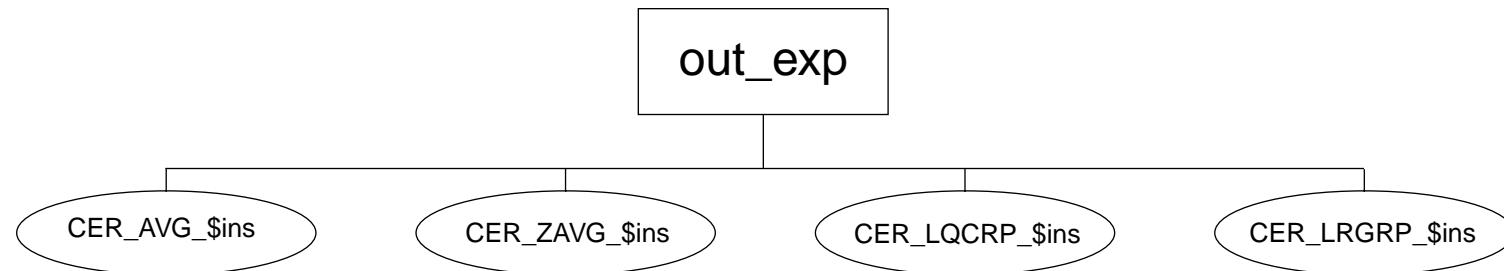
B-12

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

*These files are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 12 of 22)

Breakdown of the *tisa_avg/data/data_8/out_exp* Directory

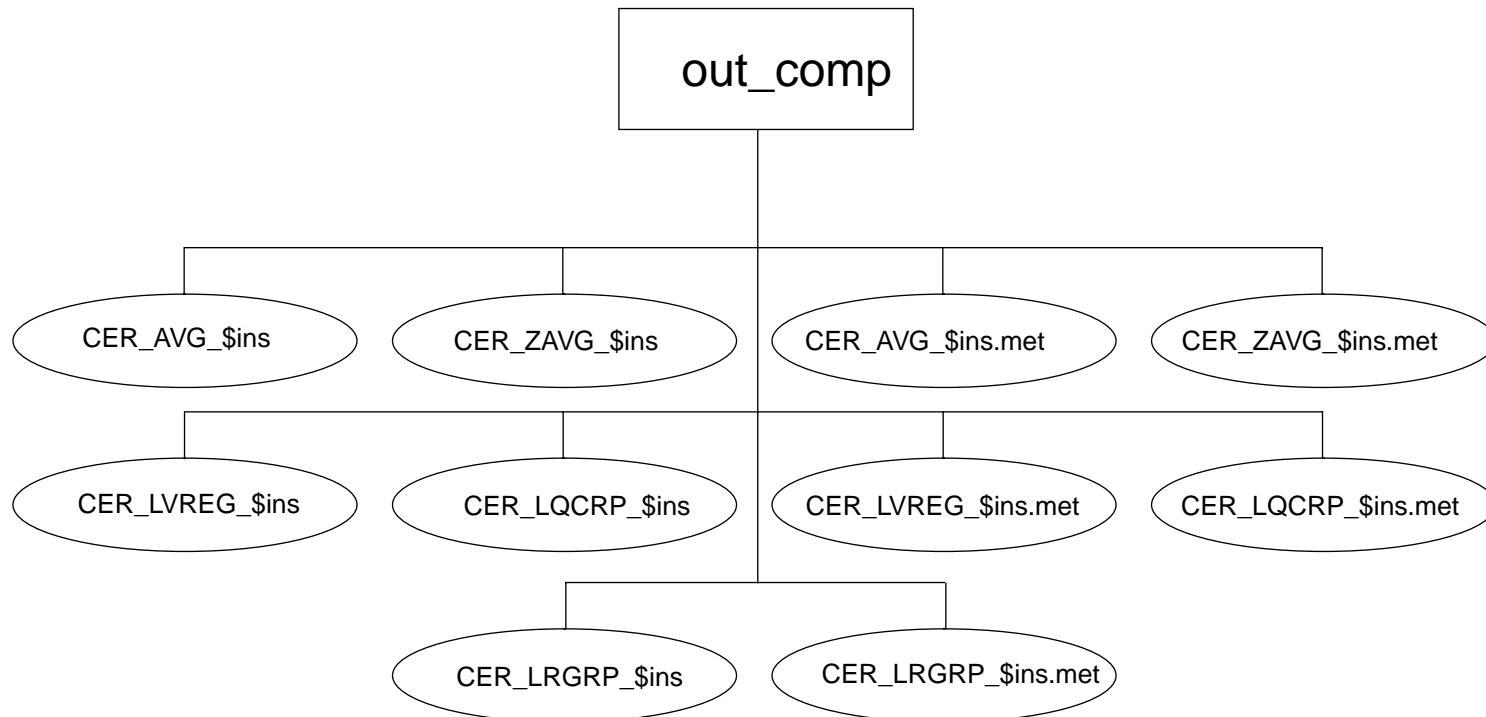


B-13

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 13 of 22)

Breakdown of the *tisa_avg/data/data_8/out_comp* Directory



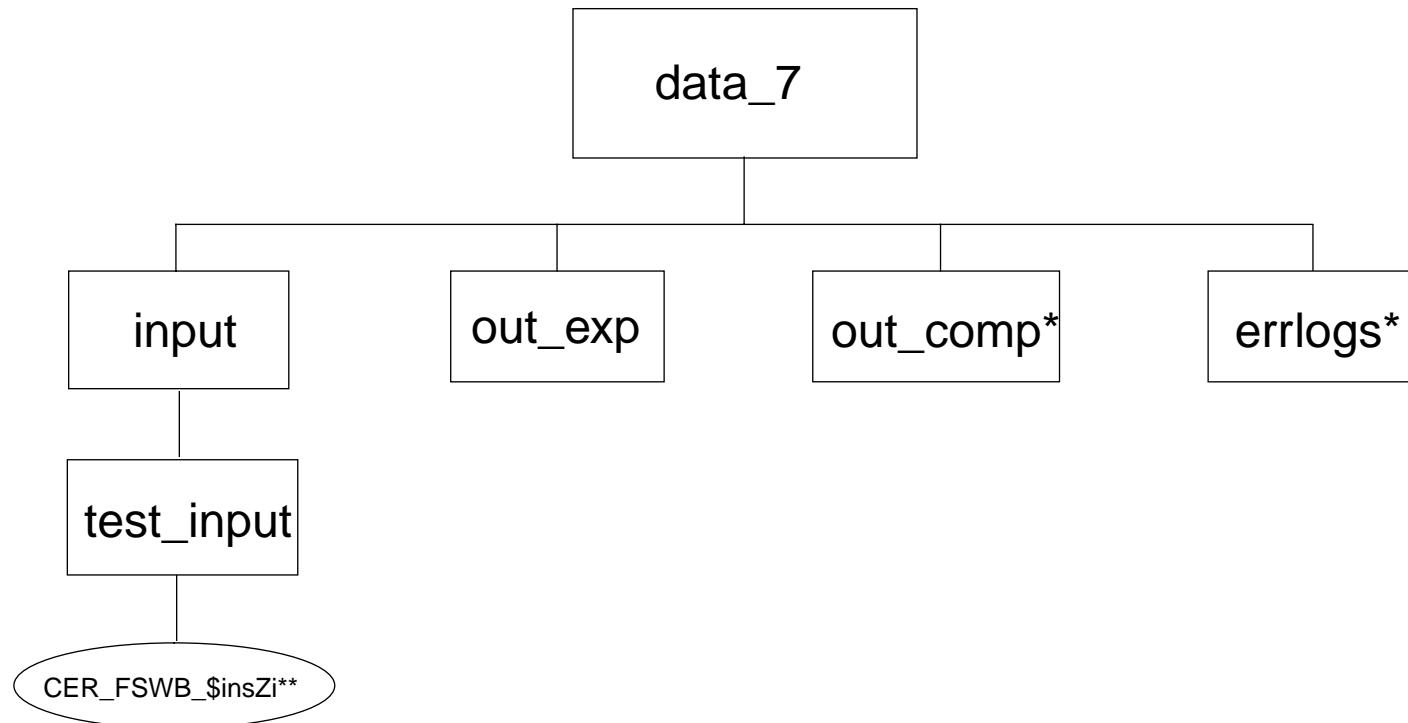
B-14

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

*All of the files in this directory are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 14 of 22)

Breakdown of the *tisa_avg*/*data*/*data_7* Directory



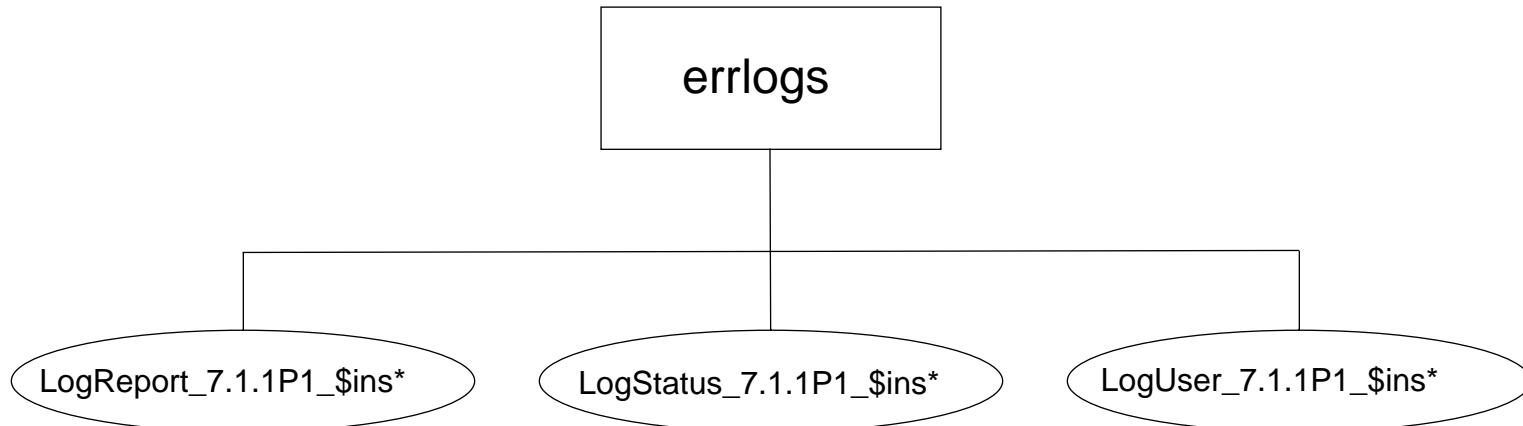
Zi** - Indicates multiple zonal files, i = 001,.., 180

\$ins - Indicates TRM-_PFM-VIRS_AtLaunch_00000.yyyymm

*Breakdown of subdirectories shown on following pages

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 15 of 22)

Breakdown of the *tisa_avg/data/data_7/errlogs* Directory



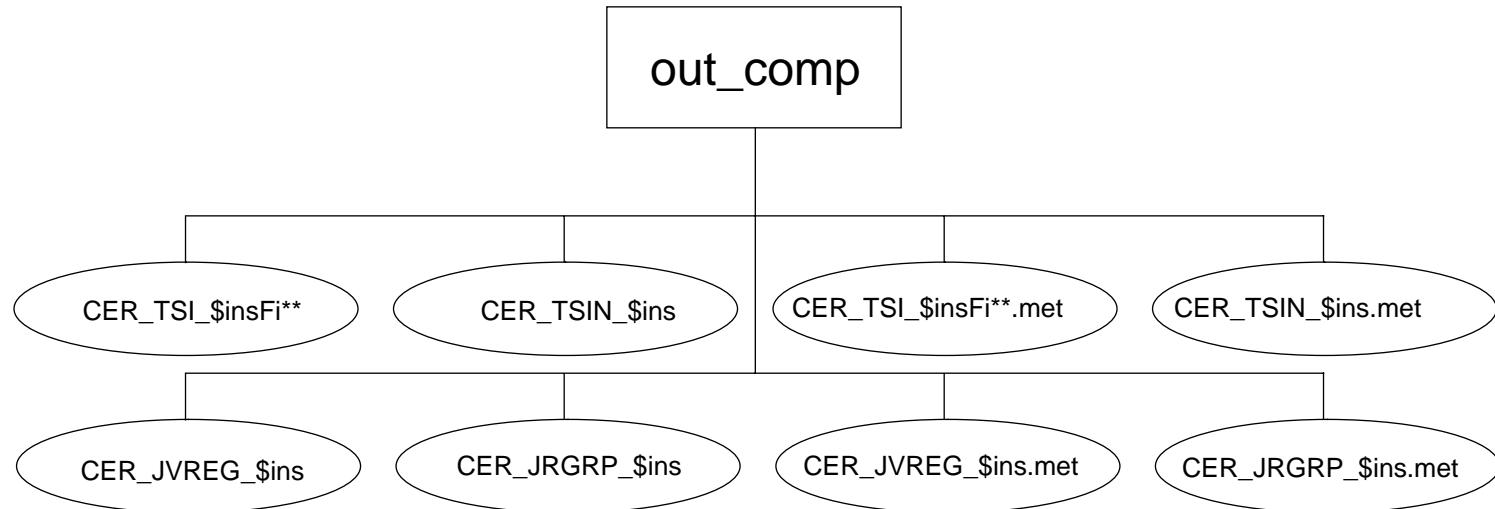
B-16

\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

*These files are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 16 of 22)

Breakdown of the *tisa_avg*/data/data_7/out_comp Directory



B-17

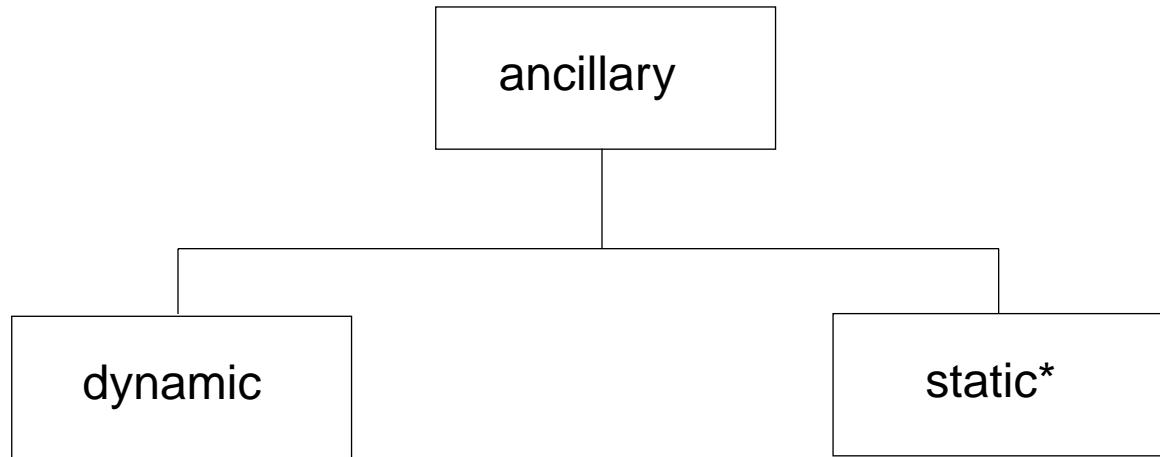
\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

Fi** - Indicates multiple files, i = 01,.., 32

*All of the files in this directory are not included in the tar file but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 17 of 22)

Breakdown of the *tisa_avg*/data/ancillary Directory

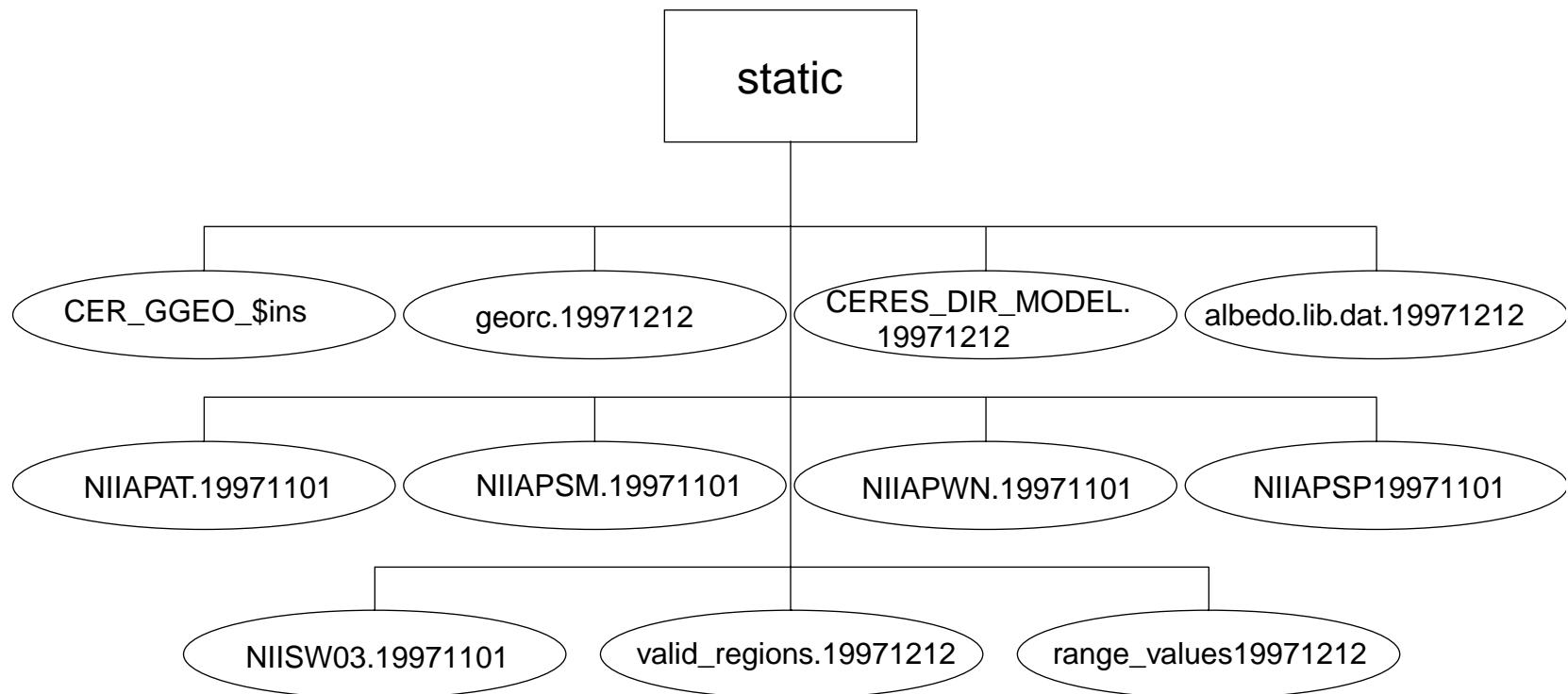


*Breakdown of subdirectories shown on following pages

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 18 of 22)

Breakdown of the *tisa_avg/data/ancillary/static* Directory

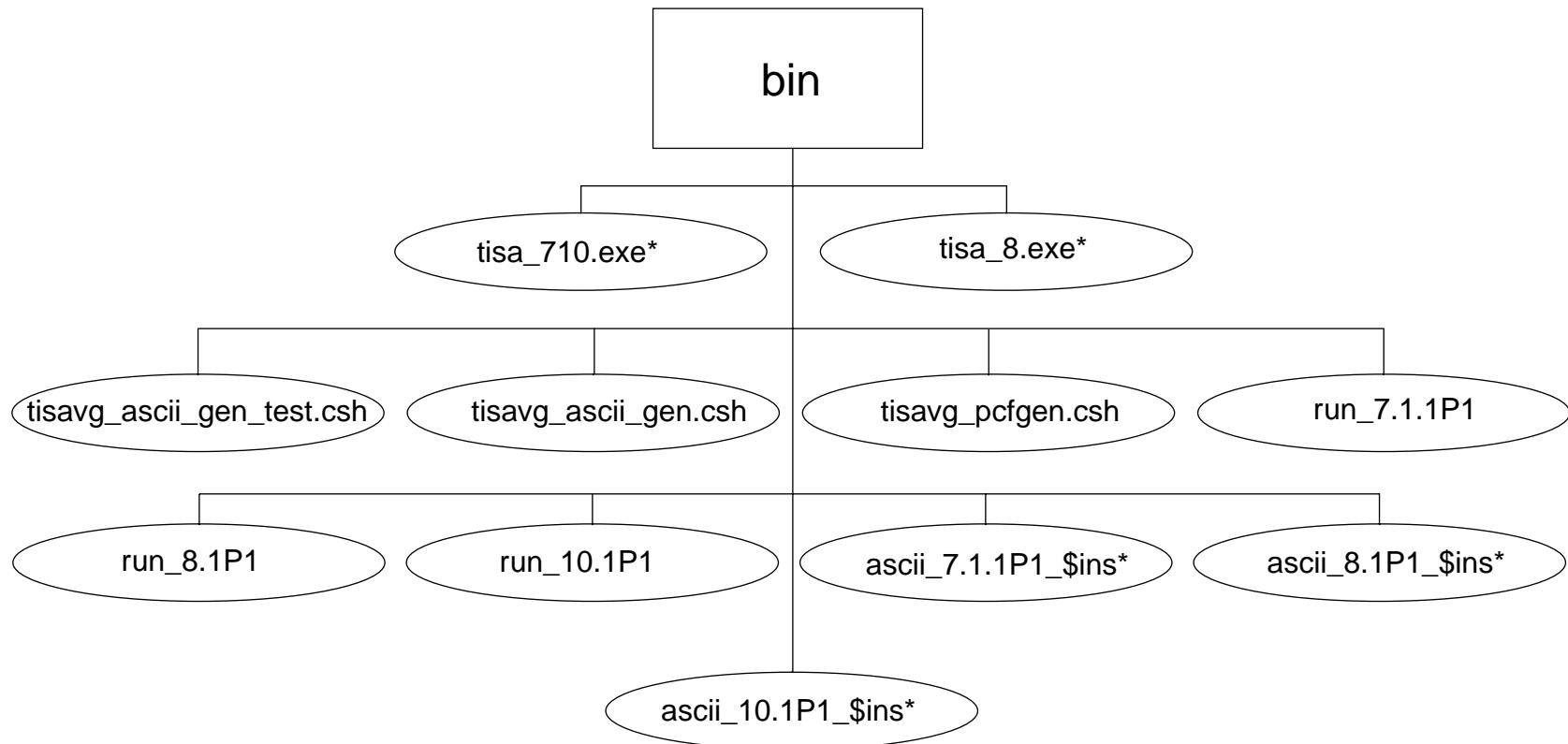
B-19



\$ins - Indicates TRMM-PFM-VIRS_PreFlight_00000.yyyymm

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 19 of 22)

Breakdown of the *tisa_avg/bin* Directory

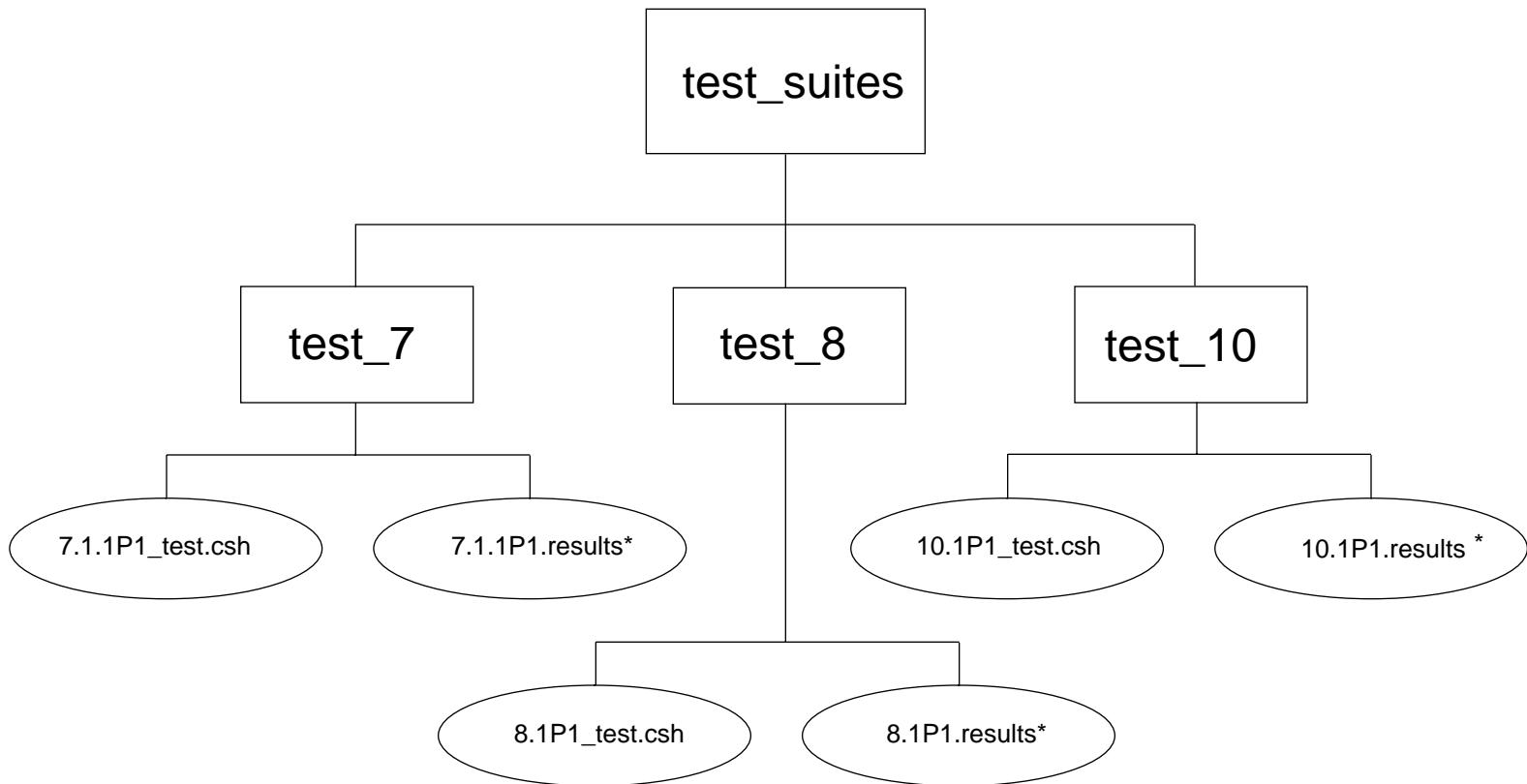


\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

* These files are not included in the tar files, but will be created by production software.

Figure B-1. Directory Structure for the TISA Averaging (tisa_avg) Tar File (Sheet 20 of 22)

Breakdown of the *tisa_avg/test_suites* Directory

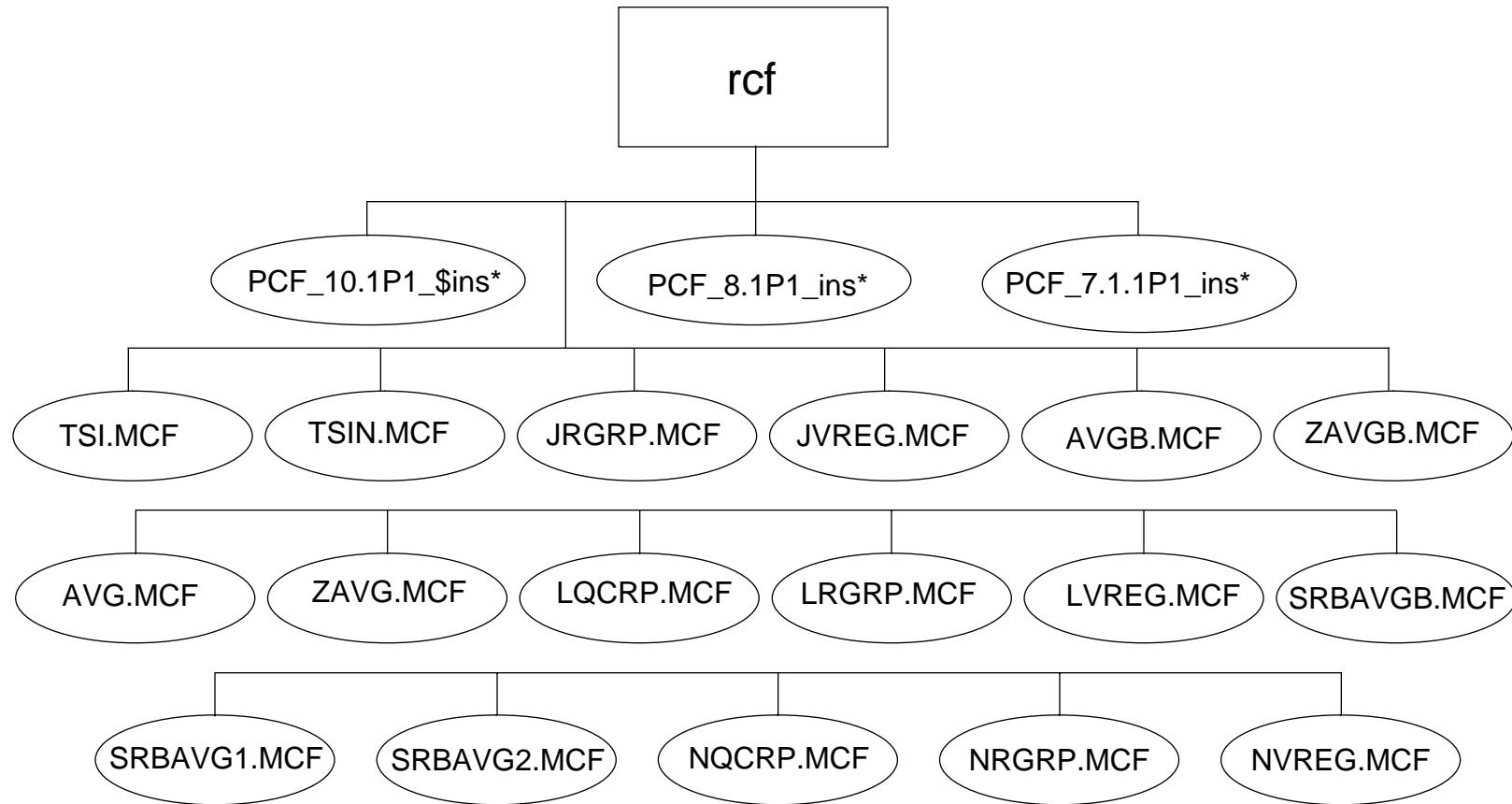


B-21

* These files are not included in the tar files and will be produced by the evaluation software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 21 of 22)

Breakdown of the *tisa_avg*/rcf Directory



\$ins - Indicates TRMM-PFM-VIRS_AtLaunch_00000.yyyymm

* These files are not included in the tar files but will be produced by the Subsystem software.

Figure B-1. Directory Structure for the TISA Averaging (*tisa_avg*) Tar File (Sheet 22 of 22)

APPENDIX C
File Description Tables

Appendix C File Description Tables

C.1 Production Scripts and Executables

Table C.1-1. Production Scripts and Executables

File Name	Format	Description
tisavg_ascii_gen.csh	ASCII	C-Shell script which creates the PCF generator's ASCII file needed Main Processor PCF file generator script
tisavg_pcfgen.csh	ASCII	C-Shell script which creates the PCF file for the main processor.
run_7.1.1P1	ASCII	C-Shell Script which executes the ss7.1 Main Processor
tisa_7.exe	Binary	ss7 Main processor executable
run_8.1P1	ASCII	C-Shell Script which executes the ss8 Main Processor
tisa_8.exe	Binary	C-Shell Script which executes the ss8 Main Processor
run_10.1P1	ASCII	C-Shell Script which executes the ss10 Main Processor
tisa_10.exe	Binary	C-Shell Script which executes the ss10 Main Processor

C.2 Processing Control Files (PCF), Metadata Control Files (MCF), and Status Message Files (SMF)

Table C.2-1. Process Control Files (PCF)

File Name.	Format	Description
PCF_7.1.1P1_TRMM-PFM-VIRS-AtLaunch_198610	ASCII	Process control file for ss7.1 Main Processor
PCF_8.1P1_TRMM-PFM-VIRS-AtLaunch_198610	ASCII	Process control file for ss8 Main Processor
PCF_10.1P1_TRMM-PFM-VIRS-AtLaunch_198610	ASCII	Process control file for ss10 Main Processor

Table C.2-2. Metadata Control Files (MCF)

File Name	Format	Description
TSI.MCF	ASCII	MCF for SS7.1 Main Processor
TSIN.MCF	ASCII	MCF for SS7.1 Secondary Index File
JVREG.MCF	ASCII	MCF for SS7.1 Validation File
JRGRP.MCF	ASCII	MCF for SS7.1 Range Report
AVGB.MCF	ASCII	MCF for binary AVG (SS8) Main Processor
ZAVGB.MCF	ASCII	MCF for binary ZAVG (SS8) Main Processor
AVG.MCF	ASCII	MCF for HDF-EOS AVG (SS8) Main Processor
ZAVG.MCF	ASCII	MCF for HDF-EOS ZAVG (SS8) Main Processor
LQCRP.MCF	ASCII	MCF for QC Report for SS8
LVREG.MCF	ASCII	MCF for SS8 Validation File
LRGRP.MCF	ASCII	MCF for SS8 Range Report
SRBAVGB.MCF	ASCII	MCF for binary SRBAVG (SS10) Main Processor
SRBAVG1.MCF	ASCII	MCF for HDF-EOS SRBAVG1 (SS10) Main Processor
SRBAVG2.MCF	ASCII	MCF for HDF-EOS SRBAVG2 (SS10) Main Processor
NQCRP.MCF	ASCII	MCF for QC Report for SS10
NVREG.MCF	ASCII	MCF for SS10 Validation File
NRGRP.MCF	ASCII	MCF for SS10 Range Report

C.3 Production Makefiles

Table C.3-1. Production Make Files

File Name	Format	Description
make7_10	ASCII	Makefile to produce ss7.1 and SS10 executable
make8	ASCII	Makefile to produce ss8 executable

C.4 Ancillary Input Data.

Table C.4-1. Ancillary Input Data

File Name	Format	Description
CERES_DIR_MODEL.19971212	Binary	Directional Models, TOA
albedo.lib.dat.19971212	ASCII	Directional Models, Surface
NIISW03.19971101	Binary	SW Angular Distribution Models (ADM)
NIILWAT.19971101	Binary	LW ERBE ADM for Sep., Oct., Nov.
NIILWSP.19971101	Binary	LW ERBE ADM for Mar., Apr., May
NIILWSM.19971101	Binary	LW ERBE ADM for Jun., Jul., Aug.
NIILWWN.19971101	Binary	LW ERBE ADM for Dec., Jan., Feb
georc.19971212	Binary	Coefficient file.
CER_GGEO_\$ins	Binary	GGEO product produced by Subsystem 11
range_values.19971212	ASCII	Contains valid range values for all TISA Averaging data product parameters
valid_regions.19771212	ASCII	Contains the validation region numbers.

C.5 Primary Input Data

Table C.5-1. Primary Input Data for Subsystem 7.1

File Name	Format	Description
CER_FSWB_TRMM-PFM-VIRS_AtLaunch_00000.198610 Z000	Binary	FSW product produced by Subsystem 6 where Z000 is the zone number and can range from 001 - 180
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986101	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986102	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986103	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986104	Binary	MOA product produced by Subsystem 12

Table C.5-2. Primary Input Data For Subsystem 8

File Name	Format	Description
CER_SYNBB_TRMM-PFM-VIRS_AtLaunch_00000.198610 D00	Binary	SYN product produced by Subsystem 7.2 where D00 is the day and ranges from 01 - 31
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986101	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986102	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986103	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986104	Binary	MOA product produced by Subsystem 12

Table C.5-3. Primary Input Data For Subsystem 10

File Name	Format	Description
CER_SFCB_TRMM-PFM-VIRS_AtLaunch_00000.198610 Z000	Binary	SFC product produced by Subsystem 9 where Z000 is the zone number and can range from 001 - 180
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986101	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986102	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986103	Binary	MOA product produced by Subsystem 12
CER_PMOA_TRMM-PFM-VIRS_AtLaunch_00000.1986104	Binary	MOA product produced by Subsystem 12

C.6 Output Data Files (Expected Results)

Table C.6-1. Subsystem 7.1 Output Data Files (Expected Results) (1 of 2)

File Name	Format	Description
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986101	Binary	Synop.hour 1 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986102	Binary	Synop hour 4 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986103	Binary	Synop.hour 7 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986104	Binary	Synop.hour 10 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986105	Binary	Synop.hour 13 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986106	Binary	Synop.hour 16 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986107	Binary	Synop.hour 19 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986108	Binary	Synop.hour 22 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986109	Binary	Synop.hour 1 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861010	Binary	Synop hour 4 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861011	Binary	Synop.hour 7 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861012	Binary	Synop.hour 10 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861013	Binary	Synop.hour 13 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861014	Binary	Synop.hour 16 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861015	Binary	Synop.hour 19 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861016	Binary	Synop.hour 22 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861017	Binary	Synop.hour 1 data of all days of the month for regions 22007-33009

Table C.6-1. Subsystem 7.1 Output Data Files (Expected Results) (2 of 2)

File Name	Format	Description
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861018	Binary	Synop hour 4 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861019	Binary	Synop.hour 7 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861020	Binary	Synop.hour 10 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861021	Binary	Synop.hour 13 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861022	Binary	Synop.hour 16 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861023	Binary	Synop.hour 19 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861024	Binary	Synop.hour 22 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861025	Binary	Synop.hour 1 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861026	Binary	Synop hour 4 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861027	Binary	Synop.hour 7 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861028	Binary	Synop.hour 10 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861029	Binary	Synop.hour 13 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861030	Binary	Synop.hour 16 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861031	Binary	Synop.hour 19 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861032	Binary	Synop.hour 22 data of all days of the month for regions 33010-44012
CER_TSIN_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	TSI Secondary Index file product produced by Subsystem 7.1
CER_JVREG_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	Validation regions data for plotting
CER_JRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Range check Report for Subsystem 7.1 data.

***NOTE:** Due to the size of 7.1 output (18 gigs), these files are not supplied in the delivery package, but can be supplied if needed.

Table C.6-2. Subsystem 8 Output Data Files (Expected Results)

File Name	Format	Description
CER_AVGB_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	AVG product contains regions data
CER_ZAVGB_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	ZAVG product contains Zonal and Global data
CER_AVG_TRMM-PFM-VIRS_AtLaunch_00000.198610	HDF	AVG HDF product contains region data
CER_ZAVG_TRMM-PFM-VIRS_AtLaunch_00000.198610	HDF	ZAVG HDF product contains Zonal and Global data
CER_LQCRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	QC report for valid region data
CER_LVREG_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	Validation Regions data for plotting
CER_LRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Range Check Report

Table C.6-3. Subsystem 10 Output Data Files (Expected Results)

File Name	Format	Description
CER_SRBAVGB_TRMM-PFM-AtLaunch_00000.198610	Binary	SRBAVG product produced by Subsystem 10
CER_SRBAVG1_TRMM-PFM-AtLaunch_00000.198610	HDF	SRBAVG HDF contains all data except cloud data
CER_SRBAVG2_TRMM-PFM-AtLaunch_00000.198610	HDF	SRBAVG HDF contains all cloud data
CER_NQCRP_TRMM-PFM-AtLaunch_00000.198610	ASCII	QC product produced by Subsystem 10
CER_NVREG_TRMM-PFM-AtLaunch_00000.198610	Binary	Validation Regions product produced by Subsystem 10
CER_NRGRP_TRMM-PFM-AtLaunch_00000.198610	ASCII	Range Check Report

C.7 Output Data Files (Production Results)

Table C.7-1. Subsystem 7.1 Output Data Files (Production Results) (1 of 3)

File name	Format	Description
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986101	Binary	Synop.hour 1 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986102	Binary	Synop hour 4 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986103	Binary	Synop.hour 7 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986104	Binary	Synop.hour 10 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986105	Binary	Synop.hour 13 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986106	Binary	Synop.hour 16 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986107	Binary	Synop.hour 19 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986108	Binary	Synop.hour 22 data of all days of the month for regions 1-11003
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.1986109	Binary	Synop.hour 1 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861010	Binary	Synop hour 4 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861011	Binary	Synop.hour 7 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861012	Binary	Synop.hour 10 data of all days of the month for regions 11004 - 22006

Table C.7-1. Subsystem 7.1 Output Data Files (Production Results) (2 of 3)

File name	Format	Description
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861013	Binary	Synop.hour 13 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861014	Binary	Synop.hour 16 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861015	Binary	Synop.hour 19 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861016	Binary	Synop.hour 22 data of all days of the month for regions 11004 - 22006
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861017	Binary	Synop.hour 1 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861018	Binary	Synop hour 4 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861019	Binary	Synop.hour 7 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861020	Binary	Synop.hour 10 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861021	Binary	Synop.hour 13 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861022	Binary	Synop.hour 16 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861023	Binary	Synop.hour 19 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861044	Binary	Synop.hour 22 data of all days of the month for regions 22007-33009
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861025	Binary	Synop.hour 1 data of all days of the month for regions 33010-44012

Table C.7-1. Subsystem 7.1 Output Data Files (Production Results) (3 of 3)

File name	Format	Description
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861026	Binary	Synop hour 4 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861027	Binary	Synop.hour 7 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861028	Binary	Synop.hour 10 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861029	Binary	Synop.hour 13 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861030	Binary	Synop.hour 16 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861031	Binary	Synop.hour 19 data of all days of the month for regions 33010-44012
CER_TSI_TRMM-PFM-VIRS_AtLaunch_00000.19861032	Binary	Synop.hour 22 data of all days of the month for regions 33010-44012
CER_TSIN_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	TSI Secondary Index file product produced by Subsystem 7.1
CER_JQCRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Validation regions QC report file for Subsystem 7.1
CER_JVREG_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	Validation regions data for plotting
CER_JRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Range check Report for Subsystem 7.1 data.

Table C.7-2. Subsystem 8 Output Data Files (Production Results)

File Name	Format	Description
CER_AVGB_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	AVG product contains regions data
CER_ZAVGB_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	ZAVG product contains Zonal and Global data
CER_AVG_TRMM-PFM-VIRS_AtLaunch_00000.198610	HDF-EOS	AVG HDF product contains region data
CER_ZAVG_TRMM-PFM-VIRS_AtLaunch_00000.198610	HDF_EOS	ZAVG HDF product contains Zonal and Global data
CER_LQCRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	QC report for validation regions data
CER_LVREG_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	Validation Regions data for plotting
CER_LRGRP_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Range Check Report

Table C.7-3. Subsystem 10 Output Data Files (Production Results)

File name	Format	Description
CER_SRBAVGB_TRMM-PFM-AtLaunch_00000.198610	Binary	SRBAVG product produced by Subsystem 10
CER_SRBAVG1_TRMM-PFM-AtLaunch_00000.198610	HDF-EOS	SRBAVG HDF contains all data except cloud data
CER_SRBAVG2_TRMM-PFM-AtLaunch_00000.198610	HDF-EOS	SRBAVG HDF contains all cloud data
CER_NQCRP_TRMM-PFM-AtLaunch_00000.198610	ASCII	QC product produced by Subsystem 10
CER_NVREG_TRMM-PFM-AtLaunch_00000.198610	Binary	Validation Regions product produced by Subsystem 10
CER_NRGRP_TRMM-PFM-AtLaunch_00000.198610	ASCII	Range Check Report

C.8 Output Temporary Data Files (Production Results)

Table C.8-1. Output Temporary Data Files (Production Results)

File Name	Format	Description
ascii_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	ASCII file created by the ASCII file generator to be used by the Main Processor's PCF generator
ascii_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	ASCII file created by the ASCII file generator to be used by the Main Processor's PCF generator
ascii_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	Binary	ASCII file created by the ASCII file generator to be used by the Main Processor's PCF generator

C.9 Error and Status Message Files (Expected Results)

Table C.9-1. Error and Status Message Files (Expected Results)

File Name	Format	Description
LogStatus_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Status file for Subsystem 7.1
LogReport_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Report file for Subsystem 7.1
LogUser_7.1.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log User file for Subsystem 7.1
LogStatus_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Status file for Subsystem 8
LogReport_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Report file for Subsystem 8
LogUser_8.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log User file for Subsystem 8
LogStatus_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Status file for Subsystem 10
LogReport_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log Report file for Subsystem 10
LogUser_10.1P1_TRMM-PFM-VIRS_AtLaunch_00000.198610	ASCII	Log User file for Subsystem 10

C.10 Test Evaluation Software

Table C.10-1. Test Evaluation Software for TISA Averaging Subsystems

File Name	Format	Description
7.1.1P1_test.csh	ASCII	Script for evaluating output of SS7.1.
8.1P1_test.csh	ASCII	Script for evaluating output of SS8
10.1P1_test.csh	ASCII	Script for evaluating output of SS10
7.1.1P1.results	ASCII	File containing the results of running 7.1.1P1_test.csh. This file is not included in the tar file.
8.1P1.results	ASCII	File containing the results of running 8.1P1_test.csh. This file is not included in the tar file.
10.1P1.results	ASCII	File containing the results of running 10.1P1_test.csh. This file is not included in the tar file.